I have succeeded in keeping individuals that had been removed from the female growing in isolation eight to eleven months, but not to adult size.

My observations and experiments lead me to believe that *Viviparus contectoides* habitually extrudes its young enclosed in an egg membrane containing more or less albuminous fluid, and that it requires from a few minutes to three hours for the young snail to actually hatch after the egg has been extruded; that this membrane does not normally envelop the young of *Campeloma decisum* and *V. malleatus* at birth, and that the young of this last species probably is free of the egg membrane some time before it is extruded.

I am indebted to Dr. H. A. Pilsbry for having identified my material of *Campeloma decisum* and to Mr. E. G. Vanatta for having identified my *Viviparus contectoides* and *V. malleatus* for me.

FRESHWATER SNAILS IN BRACKISH WATER

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On a collecting trip to Bay Head on Barnegat Bay, New Jersey, on April 10, 1928, to collect marine snails, the freshwater snail *Physa heterostropha* was observed. The locality was near the mouth of the Metedeconk River, where the water is almost fresh. The specific gravity of the water at this point at another time was 1.001.

An interesting problem presented itself. Just how far into brackish water can these freshwater snails migrate? With this in view some preliminary and rather crude experiments were attempted in the summer of 1928.

The salinity of the water was gradually increased in an attempt to see if the snails could become adjusted to the salt water, and to see just how far they would go. Three species were used: *Physa heterostropha, Lymnaea stagnalis appressa* and *Lymnaea palustris* (the latter two from Michi-

gan). All snails were taken from the culture jars in the Vivarium of the University of Pennsylvania and transferred to finger bowls at Cape May Point, New Jersey. Here they were placed in tap water for one week to adjust themselves to any possible change. After that time some were placed in sea water diluted to 5 percent concentration, and after various intervals in sea water of higher concentrations.

Because of the small number of snails used the results of this experiment can not be considered as very significant. However additional and more accurate experiments now being conducted at the University of Pennsylvania seem to give the same results in the majority of cases, and therefore this preliminary note is published.

All three species could live normally in 5 percent or 10 percent sea water, but the Physa used in the summer died when the water reached the specific gravity of 1.002. This race was probably weak, as snails of the same species taken from the streams near Philadelphia have since been kept alive and normally active in water of at least 25 percent (1.006).

The other two species used in the summer were active until the water was 25 percent of normal sea water (1.005). They had lived in this strength for about a week when they died.

Further experiments show that *Physa* and *Lymnaea palustris* behave normally in water to at least the strength of 25 percent sea water; above this strength they may live, but show few signs of activity, the body of the snail usually being projected far out of the shell. Perhaps the snails may become adjusted to higher strengths if left for a considerable period of time.